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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference NO 5531/WO	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 97/03883	International filing date (day/month/year) 17/07/1997	(Earliest) Priority Date (day/month/year) 06/08/1996
Applicant SOCIETE DES PRODUITS NESTLE S.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).
2. ☐ Unity of invention is lacking (see Box II).
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
 - ☐ filed with the international application.
 - ☐ furnished by the applicant separately from the international application,
 - ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
 - ☐ Transcribed by this Authority
4. With regard to the title, ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract, ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:
 Figure No. _____ ☐ as suggested by the applicant. ☒ None of the figures.
☐ because the applicant failed to suggest a figure.
☐ because this figure better characterizes the invention.

PATENT COOPERATION TREATY

REC'D 20 NOV 1998

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NO 5531/WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (PCT/IPEA/416)	
International application No. PCT/EP97/03883	International filing date (day/month/year) 17/07/1997	Priority date (day/month/year) 06/08/1996
International Patent Classification (IPC) or national classification and IPC A23K1/10		
Applicant SOCIETE DES PRODUITS NESTLE S.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 28/02/1998	Date of completion of this report 17. 11. 98
Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer Krajewski, D Telephone No. (+49-89) 2399-8472 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP97/03883

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-10 as originally filed

Claims, No.:

1-10 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1 - 10
	No:	Claims
Inventive step (IS)	Yes:	Claims 1 - 10
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1 - 10
	No:	Claims

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP97/03883

2 Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Ad V.:

1. Claims 1 - 9

1.1 Claims 1 - 9 relate to a canned pet food product. The product contains a base layer comprising solid food pieces in a gravy and an upper layer comprising a substantially solid foodstuff. The upper layer is capable of supporting the base layer when the pet food product is inverted. Due to the composition of the two layers, the separation between the layers is clear and distinct before and after inverting the food product from the can (p. 2, l. 20 - 22).

1.2 The subject-matter of claim 1 satisfies the requirements of Article 33(2) PCT having regard to the documents cited in the search report:

EP-A-0-121 813 (D1) discloses a semi-moist canned pet food having a free gravy. The food includes solid pieces prepared from farinaceous and proteinaceous materials. The gravy initially includes 35% - 70% water for palatability. The layers as claimed are not disclosed.

US-A-3 808 341 (D2) discloses a foodstuff having a solid central core and a coating with higher palatability. The coating may be composed of a stable emulsion to which a discontinuous coat is applied (col. 1, l. 10 - 19; l. 30. - 37; 61 - col. 2, l. 2; l. 9 - 37).

EP-A-0 285 409 (D3) discloses a canned meat and gravy pet food. The meaty pieces comprises 45 to 60% of the food. The appearance and texture of the meaty pieces and gravy are stable through retorting to provide a canned pet food product (claims, p.4, l. 9 - 14). The layers as claimed are not disclosed.

WO-A-93 24024 (D4) discloses a canned foodstuff combination having two different layers. The base layer comprises solid food pieces in a gravy (fatty gravy and cereal product). The upper layer comprises a substantially solid foodstuff (milk product). There are no indications on the weight distribution of the different products in the layers (p. 1, first paragraph; p. 5 - p. 8, fig. 1).

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP97/03883

- 1.3 The subject-matter of claims 1 satisfies the requirements of Article 33(3) PCT having regard to the prior art.

There are no indications in the prior art to provide a product having the composition of the present invention to arrive to an invertible product with two distinct layers (see point 1.1). D3 e. g. discloses a pet product having the composition of the base layer. Food products suitable for dogs made of substantially solid foodstuff (upper layer) are also well known to a person skilled in the art. Multi-layered invertible food products are known from the field of dairy products (see D4).

Thus, the product provides an unexpected structure with regard to the prior art and attains a proper technical effect due to the specific composition (distinct layers). The subject-matter of claims 1 can thus be regarded to involve an inventive step in the sense of article 33(3) PCT.

- 1.4 Claims 2 - 9 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

2. Claim 10

- 2.1 Claim 10 relates to a process for producing a canned pet food product having at least two layers. The process comprises the steps of filling a base layer comprising solid food pieces in a gravy with a defined viscosity into a can, filling an upper layer comprising a settable highly viscous foodstuff into the can, sealing the can and retorting the sealed can. Upon cooling the upper layer forms a substantially solid foodstuff. Due to the density and viscosity of both mixtures, clear and distinct layers are formed.

- 2.2 The subject-matter of claim 10 meets the requirements of Article 33(2) PCT (see point 1.1).

- 2.3 The subject-matter of claim 10 meets the requirements of Article 33(3) PCT.
The problem solved would read how to provide a process for producing a canned pet food product having at least two layers which remain clear and distinct during the production and when the product is removed from the can.
D3 e. g. discloses a process of the production of a pet product comprising solid

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP97/03883

food pieces in a gravy, the gravy comprising about 20% to 40% of the base layer (base layer). Processes for the production of settable foodstuffs which form a substantially solid foodstuff upon cooling such as meat loafs or meat emulsions are also well known in the prior art (upper layer).

There are no indications in the prior art to provide the process of the present invention, such as to adjust the viscosity of the base and upper layer to defined values in order obtain stable clear and distinct layers.

3. Industrial applicability

The subject-matter of claim 1 - 10 meets the requirements of Article 33(4) PCT

Ad VII.:

1. Claim 9

The application does not meet the requirements of Article 6 PCT, because it is not clear to which claim the dependent claim 9 refers to.

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

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Date of mailing (day/month/year) 18 March 1998 (18.03.98)	Applicant's or agent's file reference NO 5531/WO
International application No. PCT/EP97/03883	Priority date (day/month/year) 06 August 1996 (06.08.96)
International filing date (day/month/year) 17 July 1997 (17.07.97)	
Applicant MAY, Stephen et al	

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

28 February 1998 (28.02.98)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

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9/9/1 (Item 1 from file: 53)
DIALOG(R)File 53:FOODLINE(R): Food Science & Technology
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00821129 FOODLINE ACCESSION NUMBER: 502034
Layered canned pet food.
May S; Dingman S E; Rayner L
PATENT ASSIGNEE: Societe des Produits Nestle SA
PATENT: EP 923311 A1
PATENT: WO 9805219 DATE:19980212
APPLICATION COUNTRY: US (DATE(S):19960806 19970124)
PRIORITY APPLICATION DATE: 19970717
DESIGNATED STATES:
SeepublishedpatentdocumentforDesignatedContractingStates.
X-REFERENCE: PREPARED FOODS
LANGUAGE: English
DOCUMENT TYPE: Patent
FOODLINE UPDATE CODE: 19990902

ABSTRACT: A pet **food** with upper and lower **layers** of different texture and appearance is disclosed, together with a method for its production. The base **layer** has solid **food** pieces in **gravy**; the upper **layer** appears solid and has the appearance of a **meat**-loaf product. In the **can**, a conical recess is formed into the upper surface. When the **can** is **inverted** into the pet dish, it forms an attractive topping of solid pieces in **gravy**, which settles into a conical hollow in the solid **layer**. The attractive presentation enhances consumer acceptance of the product.

SECTION HEADING: CONVENIENCE FOODS
DESCRIPTORS: CANNED FOODS; CANNED PET FOODS; EUROPEAN PATENT; PACKAGED FOODS; PATENT; PET FOODS; PRESERVED FOODS; TEXTURED PET FOODS; TWO COMPONENT PET FOODS; WET PET FOODS

9/9/2 (Item 2 from file: 53)
DIALOG(R)File 53:FOODLINE(R): Food Science & Technology
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00821128 FOODLINE ACCESSION NUMBER: 502033
Multi-layered canned pet food.
May S; Dingman S E; Rayner L
PATENT ASSIGNEE: Societe des Produits Nestle SA
PATENT: EP 923310 A1
PATENT: WO 9805218 DATE:19980212
APPLICATION COUNTRY: US (DATE(S):19960806 19970124)
PRIORITY APPLICATION DATE: 19970717
DESIGNATED STATES:
SeepublishedpatentdocumentforDesignatedContractingStates.
X-REFERENCE: PREPARED FOODS
LANGUAGE: English
DOCUMENT TYPE: Patent
FOODLINE UPDATE CODE: 19990902

ABSTRACT: A **canned** pet-**food** product that contains upper and lower **layers** of different texture and appearance is presented. The base **layer** has solid **food** pieces in **gravy**; the upper **layer** appears solid and has the appearance of a **meat**-loaf product. The upper **layer** is capable of supporting the

lower when the **can** is **inverted**. Once the **food** is emptied into the pet dish, it presents an attractive **layer** of solid pieces in **gravy** on a bed of solid **meat** product.

SECTION HEADING: CONVENIENCE FOODS

DESCRIPTORS: CANNED FOODS; CANNED PET FOODS; EUROPEAN PATENT; PACKAGED FOODS; PATENT; PET FOODS; PRESERVED FOODS; TEXTURED PET FOODS; TWO COMPONENT PET FOODS; WET PET FOODS

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A23K 1/10, 1/18, A23P 1/08, B65D 85/72		A1	(11) International Publication Number: WO 98/05218
			(43) International Publication Date: 12 February 1998 (12.02.98)
(21) International Application Number: PCT/EP97/03883		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 17 July 1997 (17.07.97)		Published <i>With international search report.</i>	
(30) Priority Data: 60/022,445 6 August 1996 (06.08.96) US 60/036,731 24 January 1997 (24.01.97) US			
(71) Applicant (for all designated States except US): SOCIETE DES PRODUITS NESTLE S.A. [CH/CH]; P.O. Box 353, CH-1800 Vevey (CH).			
(72) Inventors; and (75) Inventors/Applicants (for US only): MAY, Stephen [US/US]; 1111 N. 49th Street, Saint Joseph, MO 64506 (US). DINGMAN, Steven, E. [US/US]; 4601 Cheyenne Street, Saint Joseph, MO 64503 (US). RAYNER, Luz [US/US]; 4904 Creek Crossing Drive, Saint Joseph, MO 64507 (US).			
(74) Common Representative: SOCIETE DES PRODUITS NESTLE S.A.; Attn. Bruce McConnell, P.O. Box 353, CH-1800 Vevey (CH).			
(54) Title: MULTI-LAYERED CANNED PET FOOD			
(57) Abstract <p>A canned pet food product having a base layer and an upper layer. The base layer is formed of solid food pieces in a gravy which makes up about 20 % to about 40 % of the base layer. The upper layer, which provides about 20 % to about 80 % by weight of the pet food product, is a substantially solid foodstuff. The substantially solid foodstuff is capable of supporting the base layer when the pet food product is inverted. The separation between the layers is clear and distinct.</p>			

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Multi-Layered Canned Pet Food

Field of the Invention

This invention relates to a canned pet food product which contains layers of different appearance and texture. The invention also relates to a process for
5 producing the canned pet food product.

Background to the Invention

Canned pet foods are traditionally available in two forms; meat loafs and chunk-type products. The meat loafs are particularly well known. They are usually prepared by comminuting raw meat material and mixing it with water,
10 salt, spices, curing agents, gelling agents and, if necessary, fats to provide a batter. The batter is then heated. The heated batter is then filled into cans to form, after retorting and cooling, a meat loaf.

These meat loaf products are popular because they are easily manufactured, readily digested, very palatable to animals, and are readily
15 formulated to contain necessary nutrients and trace elements. However they are in the form of a uniform, homogeneous mass which lacks the striated and chunky appearance of meat. This may be a disadvantage for pet foods since a meat-like appearance can greatly enhance consumer acceptability.

The chunk-type products overcome this difficulty since they are
20 formulated emulsions which simulate the appearance of meat. One example of these formulated emulsions is described in US patent 4,781,939. The formulated meat emulsion described in the patent is produced by first forming a meat emulsion from a meat source. Dry ingredients such as dry proteinaceous materials (for example wheat gluten and soy flour), vitamins, minerals and the
25 like are then mixed into the meat emulsion to provide a viscous emulsion. The viscous emulsion is then run through a high-speed emulsion mill in which the emulsion is rapidly heated to a temperature in the range of 102°C to 118°C. The emulsion leaving the emulsion mill is fed to a holding tube where the protein in the emulsion coagulates to form a solid emulsion product. This solid emulsion
30 product is then cut into chunks. The chunks are highly striated and resemble natural meat chunks in appearance and texture.

Another example of these formulated emulsions is disclosed in US patent 5,132,137. However, in this process the viscous emulsion is heated to a temperature of 40 to 70°C in the emulsion mill; which is much lower than that in
35 the process disclosed in US patent 4,781,939. The heated emulsion takes longer to coagulate and is therefore held in a holding tube for a longer time. The

-2-

emulsion is then formed into strands and baked in an oven at a core temperature of 70 to 95°C.

Canned pet food products which are a combination of the meat loafs and the chunk-type products are also known. These products are formed of a matrix of the meat loaf surrounding pieces of formulated emulsion products.

However there is a need for canned pet food products which have new and interesting textures and appearances to further stimulate consumer interest.

Summary of the invention

Accordingly, in one aspect, this invention provides a canned pet food product comprising:

a base layer comprising solid food pieces in a gravy, the gravy comprising about 20% to about 40% by weight of the base layer; and

an upper layer comprising a substantially solid foodstuff capable of supporting the base layer when the pet food product is inverted, the substantially solid foodstuff comprising about 20% to about 80% by weight of the pet food product.

Often, after opening a can of pet food, the consumer shakes the contents out into the pet's bowl or dish. Therefore, what was the base layer becomes the upper layer in the pet's bowl or dish. The consumer is therefore presented with an attractive layer of solid food pieces in a gravy above a clearly defined layer of a substantially solid foodstuff.

Preferably, the solid food pieces in the base layer are a formulated emulsion product having the striated appearance of natural meat. The formulated emulsion product preferably comprises about 65% to about 95% by weight of a meat material and about 5% to about 35% by weight of a proteinaceous material. If desired, the formulated emulsion product may be in the form of flakes.

The gravy preferably comprises water and about 2% to about 8% by weight of a starch; for example about 4% by weight of starch. The starch is preferably a heat sensitive starch such that its viscosity increasing properties are reduced after being heated. In particular, it is preferred that the gravy has an initial viscosity in the range of about 350 to about 1000 centipoise prior to retorting of the can but a lower viscosity after retorting. It is particularly preferred that the gravy have an initial viscosity of about 500 to about 700 centipoise; for example about 600 centipoise.

-3-

The base layer preferably has a moisture content of about 60% to about 70% by weight. It is particularly preferred that the base layer has a moisture content of about 62% to about 64% by weight; for example about 63% by weight.

5 The substantially solid foodstuff is preferably a gelled meat loaf, cooked rice, cooked noodles, or aspic, or mixtures thereof. The aspic may contain food pieces such as cooked vegetable pieces.

When the solid foodstuff is a gelled meat loaf, the upper layer preferably has a moisture content of about 70% to about 85% by weight.

10 During filling, the upper layer preferably has a viscosity in the range of about 2500 to about 4000 centipoise. A viscosity in the range of about 3000 centipoise is particularly preferred.

In another aspect, this invention provides a process for producing a canned pet food product having at least two layers, the process comprising:

15 filling a base layer comprising solid food pieces in a gravy into a can, the gravy having a viscosity in the range of about 350 to about 1000 centipoise and forming about 20% to about 40% by weight of the base layer;

filling an upper layer into the can, the upper layer comprising a settable foodstuff having a viscosity in the range of about 2500 to about 4000 centipoise and, upon cooling, forming a substantially solid foodstuff, the substantially solid foodstuff comprising about 20% to about 80% by weight of upper and base layers;

sealing the can; and
retorting the sealed can.

25 Preferably the base layer is filled into the can to provide about 30% to about 50% by weight of the upper and base layers.

In a yet further aspect, this invention provides a canned pet food product having at least two layers and produced according to the process defined above.

Detailed description of the Invention

30 Embodiments of the invention are now described, by way of example only. To produce the pet food product, a mixture of solid food pieces in a gravy and a settable foodstuff must be separately prepared.

a) Preparation of the solid food pieces in gravy:

The mixture of solid food pieces in a gravy may be prepared by simply mixing together solid pieces of meat or other material, or both, and a gravy. The meat material may be any suitable meat source, for example, muscular or skeletal meat, meat by-products or a mixture of meat and meat by-products. The meat material may be in the form of chunks or may be in the form of flakes. However, if a meat material is used, it is preferred if the solid food pieces are a formulated emulsion product. Solid pieces of other material may also be used; such as cooked rice grains, pasta or noodles, vegetable pieces, and the like.

If a formulated emulsion product, is used, it may be produced by any suitable procedure, for example the procedures described in US patents 4,781,939 and 5,132,137. In these procedures, a meat material is formed into a meat emulsion; usually by grinding and then emulsifying blocks of the meat material. The meat material may be any suitable source of animal protein; for example the muscular or skeletal meat of mammals, poultry, and fish or meat by-products such as hearts, liver, kidneys, tongue and the like. The exact composition may be selected according to cost and the desired flavor. The meat material conveniently may be in frozen form prior to grinding. Alternatively or in addition, the meat material may be in the form of meat meals such as poultry meal, fish meal, red meat meal and mixtures thereof. Again the exact composition may be selected according to cost and the desired flavor. Mixtures of any of the above may also be used. The emulsification may be carried out in any suitable equipment.

Usually a proteinaceous material is added to the emulsion to improve emulsion stability and binding. The proteinaceous material may be a vegetable or animal protein source; for example wheat gluten, soy flour, soy protein concentrates, soy protein isolates, egg proteins, whey, casein, etc. The exact choice will depend upon availability, cost and palatability. Usually about 5% to about 35% of the proteinaceous material is used.

If desired or required, fats may be added to the emulsion. Usually the amount of fat in the emulsion must be controlled to facilitate processing and to obtain an acceptable product. However, the meat material may well contain the desired amount of fats and hence adjustment may not be necessary. Typically at this stage the emulsion contains a maximum fat level of about 25% by weight. Conveniently, the amount of fat in the emulsion is in the range of about 5% to 15% by weight; more preferably about 7% to about 12% by weight. The mass

-5-

ratio protein to fat in the emulsion is preferably about 1:1 to about 7:1. If added, the fats may be any suitable animal fats; for example tallow, or may be vegetable fats.

5 Additional ingredients such as sugars, salts, spices, seasonings, flavoring agents, minerals, and the like may also be added to the emulsion. The amount of additional ingredients used is preferably such that they make up about 1% to about 5% by weight of the formulated emulsion product.

Water may also be added to provide from about 45% to 80% by weight moisture in the emulsion. If sufficient moisture is present in the meat material, 10 water need not be added.

Once mixed, the emulsion is preferably fed through a vacuum stuffer, or similar de-aeration apparatus, to de-aerate the emulsion. This removes air which may otherwise cause disruption of the formulated emulsion product and reduce its meat-like appearance.

15 The emulsion is then fed to an emulsion mill which subjects the emulsion to rapid mechanical heating and shearing. Any suitable emulsion mill may be used, for example the emulsion mill disclosed in US patent 5,132,137. Other suitable emulsion mills are commercially available under the trade name of Trigonal and may be obtained from Siefer Maschinenfabrik GmbH & Co KG, 20 Bahnhofstrasse 114, Postfach 101008, Velbert 1, Germany.

The temperature of the emulsion is raised to the desired coagulation temperature in the emulsion mill in a few seconds. For example, the temperature may be raised to from about 100°C to about 120°C. Alternatively, the temperature may be raised to in the range of about 45°C to about 75°C as 25 described in US patent 5,132,137. Usually the mechanical energy generated in the emulsion mill will be sufficient to heat the emulsion but this may be supplemented by the injection of superheated steam.

The heated emulsion leaving the emulsion mill is then transferred to a holding tube. In the holding tube, the heated emulsion coagulates while moving 30 slowly along the holding tube. The residence time of the heated emulsion in the holding tube is sufficient for the emulsion to have coagulated into a firm emulsion product upon reaching the exit of the holding tube.

The firm emulsion product leaving the holding tube is then transferred to a cutter where it is cut into chunks of size suitable for use in a pet food. The 35 chunks may be subjected to flaking if desired.

Other types of pet food chunks may also be used. For example, instead of subjecting the the emulsion to an emulsion mill, it may be heated to a temperature above about 65°C; for example in a mixer-cooker. Steam may be injected into the emulsion if desired. Then, the heated emulsion may be extruded, cooled and cut into chunks.

The gravy or sauce is produced from water, starch and suitable flavoring agents and should comprise about 20% to about 40% by weight of the mixture of solid pieces and gravy. The amount of starch used is sufficient to provide a gravy with a viscosity of about 350 to about 1000 centipoise; for example up to about 8% by weight of starch may be used. The starch is preferably such that its viscosity increasing properties break down during retorting of the canned pet food. These starches, which are commonly known as modified starches for filling retorted foods, are commercially available from Staley Manufacturing Company (2200 E. Eldorado Street, Decatur, Illinois 62525, USA) and National Starch and Chemical Company (10 FINDERNE AVENUE, BRIDGEWATER, NEW JERSEY 08807).

In place of, or in addition to, the starch, one or more suitable gums may be incorporated into the gravy. Suitable gums are kappa-carrageenan, locust bean gum, guar gum and xanthan gum.

b) Preparation of the settable foodstuff:

When the substantially solid foodstuff is selected to be a gelled meat loaf, the settable foodstuff is a meat batter. The meat batter may be prepared by emulsifying a suitable meat material to produce a meat emulsion. The meat material may be any suitable meat source, for example as described above. Suitable gelling or thickening agents, for example gums such as kappa-carrageenan, locust bean gum, guar gum and xanthan gum may be added to the meat emulsion. Usually no more than about 2% by weight of gelling or thickening agent is needed.

Additional ingredients such as sugars, salts, spices, seasonings, flavoring agents, minerals, and the like may also be added to the meat emulsion. The amount of additional ingredients used is preferably such that they make up about 0.25% to about 5% by weight of the meat batter.

-7-

Water may also be added the meat emulsion to provide from about 70% to about 85% by weight. If sufficient moisture is present in the meat material, water need not be added.

5 The meat emulsion is then heated to a temperature above about 65°C in a mixer-cooker. Steam may be injected into the meat batter if desired. The heated meat emulsion is then again emulsified to provide the meat batter and the meat batter maintained at a temperature above about 60°C until needed. At this stage, the meat batter has a viscosity in the range of about 2500 to about 4000 centipoise.

10 Alternative, the substantially solid foodstuff may be cooked rice or noodles, or both. In this case, the settable foodstuff may be freshly cooked rice or noodles. Upon cooling, the freshly cooked rice or noodles form a substantially solid layer. If desired, suitable gelling or thickening agents, for example gums such as kappa-carrageenan, locust bean gum, guar gum and xanthan gum may be
15 added to the rice or noodles. Usually no more than about 2% by weight of gelling or thickening agent is needed.

Additional ingredients such as sugars, salts, spices, seasonings, flavoring agents, minerals, and the like may also be added to the rice or noodles. The amount of additional ingredients used is preferably such that they make up about
20 0.25% to about 5% by weight of the settable foodstuff.

Alternative, the substantially solid foodstuff may be an aspic; for example an aspic which contains cooked vegetable pieces. The aspic may be prepared as is conventional. Additional ingredients such as sugars, salts, spices, seasonings, flavoring agents, minerals, and the like may also be added to aspic. The amount
25 of additional ingredients used is preferably such that they make up about 0.25% to about 5% by weight of the aspic.

c) Canning:

30 The mixture of the solid food pieces and gravy and the settable foodstuff are then fed to suitable filling machines; one for filling the solid food pieces and gravy and one for filling the settable foodstuff. For filling the solid food pieces and gravy, a pocket filling is particularly suitable. Pocket fillers are commercially available; for example from Luthi Machinery and Engineering Co.,
35 Inc (1726 W. 180th Street, Gardena California, 90248, USA), Carruthers Equipment Company (1815 N. W. Warrenton Drive, Warrenton, Oregon 97146,

-8-

USA) and Zilli & Bellini SPA (Via Benedetta, 85/A, 43100 Parma, Italy).

Suitable filling machines for filling the settable foodstuff are commercially available from Hema USA Inc (426 W. Universal Circle, Sandy, Utah 84070, USA), PRC (2582 S. Tejon Street, Englewood, Colorado 80110, USA). During filling, the settable foodstuff should be maintained at a temperature or other conditions to prevent settable.

A metered amount of the mixture of the solid food pieces and gravy is fed into each can entering the pocket filler in a defined layer comprising about 20% to about 80% of the volume or weight of the product. For example, the layer may make up about 30% to about 70% of the volume or weight of the product. The cans are then fed to a separate filling machine for filling the settable foodstuff. A metered amount of the settable foodstuff is then fed onto the mixture of the solid food pieces and gravy. Due to the density and viscosity of the mixture of the solid food pieces and gravy and the density and viscosity of the settable foodstuff, clear and distinct layers are formed in the can. These layers remain clear and distinct during seaming of the cans; despite the rotational movement of the cans. After having cooled, the settable foodstuff will form a firm, substantially solid layer.

The cans are then retorted under conditions sufficient to effect commercial sterilization in the normal manner. Typically the cans are retorted at a temperature of about 115°C to about 125°C for about 30 to 100 minutes. During the retorting operation, the starch in the gravy preferably breaks down such that the previously viscous gravy takes on the appearance of a thin, runny sauce.

The cans therefore contain a product which comprises a lower layer made up of solid pieces of food in a thin sauce and an upper layer of a substantially solid foodstuff. The layers are clear and distinct and the product is visually attractive once removed from the can.

Example 1

a) Production of solid food pieces in gravy

Blocks of frozen meat made up of beef, pork, poultry, fish and meat by-products are cut into pieces of about 10 cm in size and the pieces are then ground in a meat grinder. The ground meat is transferred to a mixer in which it is heated to a temperature of about 0°C. After mixing, the ground meat is fed into an

-9-

emulsifier in which it is emulsified and heated to a temperature of about 20°C. The meat emulsion is then transferred to a mixer. A blend of dry proteinaceous material made up of a mixture of wheat gluten, soy flour and soy protein concentrate is added. Additives in the form of vitamins, minerals, flavoring agents, sugars and salts are then added. At this stage, the emulsion is made up of about 77% by weight of meat materials, about 21% by weight of the proteinaceous material and about 2% additives. The fat content is about 10% by weight and the moisture content is about 55% by weight.

The emulsion, at a temperature of about 35°C, is then pumped to an emulsion mill in which it is rapidly heated up to a temperature of about 107°C. The hot emulsion is ejected from the emulsion mill into a holding tube. The emulsion moves slowly through the holding tube such that it is sufficiently cooled and coagulated upon exiting the tube. The coagulated product leaving the holding tube is then cut into cubes of about 2 cm dimension. The chunks have a highly striated, meat like appearance. The chunks are then cooled and flaked to produce flakes of about 1 to about 2 cm size. The flakes are screened to remove small fragments.

A gravy is then prepared by mixing a modified starch, flavoring and coloring agents, and water. The gravy has a viscosity of about 600 centipoise. The mixture is heated to about 80°C and then blended with the flakes. The gravy provides about 30% by weight of the mixture of solid food pieces and gravy.

b) Production of meat batter

Blocks of frozen meat made up of beef, pork, poultry, fish and meat by-products are cut into pieces of about 10 cm in size and the pieces are then ground in a meat grinder. The ground meat is transferred to a mixer and heated. Vitamins, minerals, flavoring agents, salts and about 1% by weight of a gum mixture are added. The mixture is heated to about 75°C under mixing and maintained at this temperature. The meat batter has a viscosity of about 3000 centipoise.

c) Canning

The mixture of solid food pieces in gravy is then transferred to a pocket filler obtained from Carruthers Equipment Company and filled into cans. The

-10-

amount of the mixture of solid food pieces in gravy is selected to provide about 40% of the total product weight in the can. The cans are then transferred to a filling machine obtained from PRC. The remaining space in each can is filled with meat emulsion.

- 5 The cans are then seamed and retorted. A can is opened and turned out onto a plate. The product has a clearly defined lower layer made up of meat loaf topped by a layer of meat flakes in a thin sauce.

Example 2

- 10 The process of example 1 is repeated except that cooked rice is substituted for the flakes of formulated meat emulsion in the solid food pieces and gravy. A can of the product is opened and turned out onto a plate. The product has a clearly defined lower layer made up of meat loaf topped by a layer of cooked rice
- 15 in a thin sauce.

Example 3

- 20 The process of example 1 is repeated except that freshly cooked rice is used in place of the meat batter. A can of the product is opened and turned out onto a plate. The product has a clearly defined lower layer made up of rice topped by a layer of meat flakes in a thin sauce.

Claims

1. A canned pet food product comprising:
a base layer comprising solid food pieces in a gravy, the gravy comprising
5 about 20% to about 40% by weight of the base layer; and
an upper layer comprising a substantially solid foodstuff capable of
supporting the base layer when the pet food product is inverted, the substantially
solid foodstuff comprising about 20% to about 80% by weight of the pet food
product.
10
2. A product according to claim 1 in which the solid food pieces in the base
layer are a formulated emulsion product having the striated appearance of natural
meat.
- 15 3. A product according to claim 2 in which the formulated emulsion product
is in the form of flakes.
4. A product according to claim 1 in which the gravy comprises water and
about 2% to about 8% by weight of a heat sensitive starch which undergoes a
20 reduction in its viscosity increasing properties during heating.
5. A product according to claim 1 in which the gravy has an initial viscosity
in the range of about 350 to about 1000 centipoise prior to filling of the base
layer into the can.
25
6. A product according to claim 1 in which the base layer has a moisture
content of about 60% to about 70% by weight.
7. A product according to claim 1 in the substantially solid foodstuff is a
30 gelled meat loaf, cooked rice, cooked noodles, or aspic, or mixtures thereof.
8. A product according to claim 7 in which the upper layer has a moisture
content of about 70% to about 85% by weight.

-12-

9. A product according to claim 9 in which the upper layer has a viscosity in the range of about 2500 to about 4000 centipoise during filling of the upper layer into the can.

5 10. A process for producing a canned pet food product having at least two layers, the process comprising:

filling a base layer comprising solid food pieces in a gravy into a can, the gravy having a viscosity in the range of about 350 to about 1000 centipoise and forming about 20% to about 40% by weight of the base layer;

10 filling an upper layer into the can, the upper layer comprising a settable foodstuff having a viscosity in the range of about 2500 to about 4000 centipoise and, upon cooling, forming a substantially solid foodstuff, the settable foodstuff comprising about 20% to about 80% by weight of upper and base layers;

sealing the can; and

15 retorting the sealed can.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 97/03883

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 6 A23K1/10 A23K1/18 A23P1/08 B65D85/72

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A23K A23P B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0 285 409 A (THE QUAKER OATS COMPANY) 5 October 1988 ---	1
A	WO 93 24024 A (MULTIFORSA AG) 9 December 1993 -----	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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審査請求 未請求 発明の数 1 (全4頁)

⑮ 発明の名称 容器入り層状冷凍ソース掛け食品

⑯ 特 願 昭61-256328

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明 細 書

1. 発明の名称

容器入り層状冷凍ソース掛け食品

2. 特許請求の範囲

冷凍ソースと、冷凍米飯を層状に形成してなる層状冷凍ソース掛け食品を、少なくとも容器側面と該冷凍ソースとが接触する部分の50%以上(面積比)を覆う位置にマイクロ波遮断層を設けた容器中に収納してなる容器入り層状冷凍ソース掛け食品。

3. 発明の詳細な説明

〔産業上の利用分野〕

本発明は、電子レンジ解凍加熱に好適な容器入り層状冷凍ソース掛け食品に関し、さらに詳しくは、電子レンジによる解凍加熱時に乾燥や焦げを生じることなく均一に解凍復元が為し得る容器入り層状冷凍ソース掛け食品に関する。

〔従来技術〕

近時、調理加工に手間がかからず、長期保存が可能であり買回し置きもできることから、種々の冷

凍食品が広く家庭等に普及しており、なかには電子レンジ解凍用と銘打った冷凍食品も見受けられる。

しかしながらカレーライスやハヤシライス、ドリア、親子丼、牛丼等所謂ソース掛け食品にあっては、最終の出来上がり食品(ソースが米飯上に掛った状態のもの)をそのまま冷凍した場合、ソースと米飯が入り混じったものとなり、製品としてのみばえが悪いだけでなく、これを電子レンジ加熱に付した場合、ソースから露出した食材表面に乾燥や焦げが生じた。

また、冷凍ソースと冷凍米飯を層状に形成した場合でも、該ソース周辺部(容器側面との接触部)が過加熱されて該部分が乾燥したり、焦げが生じることがあった。

又、該ソース部が該米飯部に比して加熱され易く、そのため復元状態(加熱状態)に於いて、不均一なソース掛け食品が得られ易かった。

そこで本発明者等は、上記問題点を悉く解消し、電子レンジ解凍加熱に好適な冷凍ソース掛け食品

を提供すべく、電子レンジによる解凍加熱の際の加熱動向の検討を中心として種々研究を重ねた結果、冷凍ソースと冷凍米飯を層状に形成してなる層状冷凍ソース掛け食品を、少なくとも容器側面と該冷凍ソースとが接触する部分の50%（面積比）を覆う位置にマイクロ波遮断層を設けた容器中に収納することによって前記課題の解決に成功した。

【構成の詳細な説明】

本発明のソース掛け食品としては、カレーライスやハンバーグ、ドリア等の洋風ソース掛け食品を始め、親子丼、牛丼、中華丼等の所謂丼物等、料理の和、洋、中を問わず、米飯上にソースを掛けて喫食に供するタイプの食品がその対象となり、ソースの原材料、調製方法、水分含量、油類含量あるいは具材の種類、量等一切問わない。

本発明は、容器内に於いて上方より順に冷凍ソースと冷凍米飯を層状に形成してなることを特徴とする。

該構成の態様によって、出来上がりソース掛け

る。

該構成の態様により電子レンジ解凍加熱の際のソース周辺部のマイクロ波による過加熱が抑制され、その結果、該部分の乾燥や焦げの発生を有効に抑制し得る。

さらにはソース部と米飯部が均一に加熱されるため復元加熱状態に於いてムラのないソース掛け食品が得られる。

この場合、マイクロ波遮断層の上下端としては、対ソース部幅の90%～150%となる如く設定するのが、前記ソース部の乾燥、焦げ防止効果及び均一復元加熱効果を一層良好に発揮し得る点、あるいは加熱効率の観点よりも好ましい。

なかでも特に乾燥、焦げが顕著に現われるソース表面部にかかるようなマイクロ波遮断層の被覆態様が好ましい。

本発明のマイクロ波遮断層を構成する材質としては、マイクロ波不透過性の金属材料、例えば、アルミニウム、ニッケル、クロム、鉄、亜鉛、スズ等が例示し得る。

食品をそのまま冷凍したものに比して製品としての外観が良好なものとなるとともに、電子レンジ等による解凍加熱後も出来たてのソース掛け食品と同等な食感をそその良好な外観を呈したものとなる。

さらに本発明品は、冷凍ソースと冷凍米飯が層状に形成されているため使用するソース掛け食品の粘度が低い場合にも電子レンジ解凍の際、食肉片や野菜片等の具材が該ソースから露出する時間が短く、従って具材が乾燥したり焦げたりすることがない。

さらに本発明品は、加熱復元や喫食に際して別途食器を準備する必要もなく、電子レンジ等によるワンタッチの加熱復元操作で短時間に良好なソース掛け食品と為し得る。

さらに本発明は、冷凍ソースと冷凍米飯を層状に形成してなる該層状冷凍ソース掛け食品を、少なくとも容器側面と該冷凍ソースとが接触する部分の%50%（面積比）を覆う位置にマイクロ波遮断層を設けた容器中に収納することを特徴とす

又、該マイクロ波遮断層の容器側面部への設置方法についても特に限定されるものではなく、例えば、容器本体構成部材に前記金属の薄層を接着、ラミネートしたり、あるいは金属印刷等の手段により設けることができるが、容器側面のその部分全体を金属材料で構成することもできる。該マイクロ波遮断層の設置態様としては、前述した他に、第2図に示す如く容器上方開放部を覆う蓋の袖部、あるいは容器本体に装着されるリング等に設けることも可能である。

この場合、該マイクロ波遮断層と容器本体間に空気層が介在するため加熱効率が一層高まるとともに、該遮断層に発生する誘導加熱が著しく低減し、たとえ該誘導加熱が発生したとしても、これによるソース掛け食品や容器本体への悪影響を最少限に抑えられ好ましい。

該空気層の厚さ（図中L）としては、0.5mm以上さらに好ましくは、1.5～20mmとするのが前記効果を有効に奏する上で望ましい。

又、本発明では、該蓋の上面部に該マイクロ波

遮断層を設けることも可能である。

次に本発明で使用する容器としては、電子レンジ加熱に耐え得る程度の耐熱性を有しているのが好ましく、さらに冷凍保管に耐え得る耐凍性及び耐水性を有することが要求される。

そして該容器は、ポリエチレン、ポリプロピレン等の合成樹脂や各種紙材等あるいはそれらのラミネート材等高周波を透過するものを主体として構成することが必要とされる。

本発明の容器形状に関しては、片タイプ、カップタイプ、角形タイプ等どのようなものでもよく、又その大きさも問わない。

さらに本発明に於いて冷凍ソース中にゼラチンを使用する場合は、以下の如く好ましい結果が得られる。

即ち、冷凍牛丼等比較的水分含量の高いソースを用いるソース掛け食品を解凍した場合にもゼラチンの有する保水力によりソース中の水分の米飯中への移行が抑制されベチャベチャ感のない良好な食感の米飯が得られる。

さらには該ゼラチン入りのソースを冷却すれば、ゼラチンの凝固作用によってソースの保型性が維持し得るため、ソースを冷凍あるいは容器に充填するに際して非常に取り扱い易いとともに、米飯上に凝固ソースを就置後兩者を同時に冷凍することも可能である。

又、該ゼラチンの存在により冷凍ソースのカット処理等の成型操作をヒビ割れ等を起こすことなく円滑に実施し得る。

本発明品の形態としては、必ずしも冷凍ソースが冷凍米飯表面部の全てを覆う必要はなく、又、該両層間に空間を介して容器内に収納することも可能である。

又、本発明では、上方より冷凍米飯、冷凍ソースの順に層状冷凍ソース掛け食品を形成することも可能である。

又、本発明では、冷凍ソースや冷凍米飯の形状を必ずしも製品容器形状とその周縁部に於いて台形させたり、又その上面や下面を平坦状に成型する必要はない。

加えて流通、保管時に於けるソース内水分の離水も有効に抑制し得、製品品質維持が図れる。

この場合、ゼラチンの使用量としては、2%～15%（対ソース重量比）が好ましい。

本発明の容器入り冷凍ソース掛け食品の調製法としては、所定量の米飯を最終の容器内にて冷凍し、あるいは該容器と略同形の成型容器内で冷凍された米飯を製品容器中に充填した後、ソースをそのまま該冷凍米飯上に注入して冷凍する方法、又該容器と略同形の成型容器中で冷凍したソースを該米飯上に就置する方法が例示される。

該就置法による時は、ソースの作り留めが利く点で生産管理上有利であるとともに、米飯を単独で冷凍処理に付するため短時間で冷凍処理が完了するから米飯のβ化が進行し難く、そのため食味、食感の良好な米飯が得られる点からも好ましい。

前記ソースをそのまま冷凍米飯上に注入する方法を採る場合に於いては、ゼラチンをソース中に添加すれば、ソースが適度な粘度を呈するためソースの米飯中への染み込みが有効に抑制される。

さらに澱粉等の増粘剤を添加すれば、解凍時の離水を防ぐに一層有効であり、又レシチン等の乳化剤は、冷凍過程での水分、油脂の分離を抑えるに効果がある。

この場合のレシチンの添加量は、対ソース重量比で0.2～0.5%が好ましい。

本発明で使用する冷凍米飯としては、通常の炊飯あるいは蒸し処理によって得られた米飯の使用が可能であり、喫食し得る状態のものであれば、原料米種類、水分含量、α化程度の如何を問わない。

但し、乳脂肪等の糖類の添加は、その有する保水効果によって、凍結処理に附する際の米飯のβ化を抑える点で有効である。その添加量としては、対米飯10%程度（重量比）が好ましい。

さらに、レシチン等の乳化剤の混入した油脂と水の乳化液を米飯に添加すれば、米飯粒表面に乳化被膜を形成することによって、該表面での水分凝集を抑制し、その結果、米飯のβ化を抑制するとともに、解凍時のベトベト感を解消し、さらに

は飯粒の固着化も防止し得る。

又、該炊飯処理等の米飯調製は、最終の製品容器中で行なってもかまわない。

また本発明に於いては、野菜片や牛肉片等の各種具材をソースとは別体として固状に、あるいは各片が独立した状態で冷凍せしめ容器内に充填することも可能であり、製品としての外観を一層向上させることができる。

尚上記態様による場合は、該具材等を冷凍米飯と冷凍ソースの中間に位置させ、さらには該具材間をも覆うようにマイクロ波遮断層を設けることが、電子レンジ解凍加熱時の具材の乾燥や焦げを防止する上で好ましい。

〔本発明の効果〕

本発明の容器入り固状冷凍ソース掛け食品は、電子レンジ解凍加熱時にソース周辺部にも乾燥や焦げを生じることがないとともに、ソース、米飯ともに均一に解凍加熱が為し得、復元加熱ムラのない良好な品質のソース掛け食品が得られる。

又、本発明品は、家庭等で食器を準備する手間

が入らず、そのまま短時間の電子レンジ加熱や沸騰水中加熱等の解凍加熱操作を行なうだけで喫食に供し得る。

〔実施例〕

カレーウ70g、水150g、ゼラチン20g、そして具材として牛肉片200g、玉葱片250g以上の原材料を使用して常法によりカレーソースを調製した。

然る後これを径70mmの円筒形成型容器に充填後冷凍した。

一方通常の炊飯処理によって米飯100gを調製し、これを第1図に示す口径70mm、高さ65mmのテーバー状容器(最終製品用容器)に充填後冷凍した。

尚、該容器は、図面に示すように容器側面上高さ45mmの地点より20mm幅にてアルミ箔が周縁状に設けられている。

該冷凍米飯(45mm厚)上に前記カレーソースを約15mm厚にカットしたもの(約45g)を取納収置して本発明の容器入り固状冷凍カレーを構

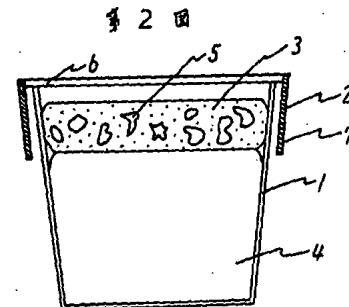
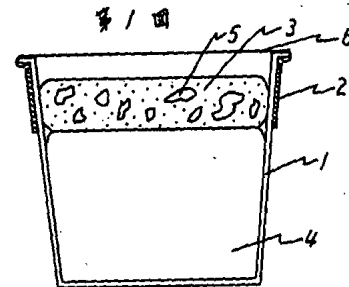
た。

該本発明品を電子レンジによって(500W)4分間加熱したところカレーソース、米飯ともに何ら加熱ムラなく良好な風味と外観を呈しさらにベチャベチャ感のない米飯を有したカレーライスが得られた。

4. 図面の簡単な説明

第1～2図は、本発明の実施例を示す断面図である。

1……容器、2……アルミ箔、3……冷凍ソース、4……冷凍米飯、5……具材、6……蓋、7……袖部



PATENT SPECIFICATION

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DRAWINGS ATTACHED

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 A2E 2



(54) PROCESS OF PRODUCING A FOOD PRODUCT

- (71) We, THE QUAKER OATS COMPANY OF CANADA LIMITED, of Peterborough, Ontario, Canada, do hereby declare this invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- This invention is concerned with a process of producing a food product which may be a pet food or a food product intended for human consumption. More specifically, the invention relates to the production of a meat product in which the meat is in the form of discrete cooked dices in an edible liquid, or gravy, environment, the term "meat" as herein used including fish and fowl such as poultry, as well as the meat of mammals.
- In the pet food trade, and also in the trade relating to the production of food products for human consumption, it has in the past been the practice, with the view of reducing the cost of production of meat food products of the type referred to above, to include with the meat flesh a proportion of meat byproducts, such as gullet, heart, and intestines of mammals or fowl or, for example, the head, intestines and bones of fish, or even, particularly in the case of pet foods, to use meat byproducts exclusively. The term "meat" as herein used includes both meat flesh and meat byproducts, as well as mixtures thereof.
- As will be appreciated the use of meat byproducts, whether alone or together with meat flesh, necessitates fine comminution of the byproducts in order to destroy the identity thereof.
- While various processes have hitherto been proposed for the production, using meat byproducts, of meat products of the type referred to it is a disadvantage of the products produced by a number of these processes that the dices of meat tend to disintegrate in the gravy environment.
- It is an object of the present invention to provide a process of producing a meat food product of the type referred to wherein the diced meat substantially retains its form as discrete integral lumps in the gravy environment, such a product being in many respects more acceptable to the consumer than a meat food product in which the meat is in the form of a single relatively large block of compressed ground meat or in which the product has the consistency of a pulp.
- In a process according to the invention meat is finely comminuted to form an emulsion having substantially the consistency of a pulp. The temperature of the emulsion is then lowered to render the emulsion in a frozen or semi-frozen state, and the frozen or semi-frozen emulsion is diced. Finally, the diced, frozen or semi-frozen emulsion is covered with an edible liquid having a temperature of at least 190°F thereby to heat set the protein material in the outer surfaces of the emulsion dices, and the diced emulsion is cooked.
- In order that the invention may be more clearly understood and more readily carried into effect the same will now, by way of example, be described more fully with reference to the accompanying drawing which is a flow diagram of a process according to a preferred embodiment of the invention.
- With reference to the drawing, uncooked meat at a temperature which is preferably within the range 30°F to 40°F but which may be substantially lower is ground in a meat grinder which may be of conventional form and operation, the meat, the nutritional properties of which are retained to a high degree by processes according to the invention, comprising both meat flesh and meat byproducts although it is to be understood that in alternative embodiments of the invention the meat may consist entirely of meat flesh or entirely of meat byproducts. Where the meat consists entirely of meat flesh, in which case the meat product will generally be intended for human consumption, the process according to the invention serves to tenderize the resultant meat product; this may be

of importance in, for example, the case of baby foods.

By, if necessary, adding water to the meat, although this is not in general required, it is preferably arranged that the ground meat contains a major portion, say between 65% and 80%, by weight of water.

The ground meat together with a meat binding agent which may for example be milk powder or a cereal binder such as, for example, wheat flour, is passed through an emulsifying unit which consists essentially of a high speed rotary cutting disc and which may be of conventional form, sodium nitrite and artificial flavourings being, if desired, also passed through the emulsifying unit with the ground meat. In addition, a vitamin and/or mineral supplement may be added to the ground meat in the emulsifying unit. Air or an inert gas, such as nitrogen, may be introduced into the mixture in the emulsifying unit and an emulsifying agent or agents, such as a monoleate or monostearate, may also be introduced into the mixture thereby to thicken the finely comminuted meat emulsion which is produced and thus enable the emulsion to contain a larger amount of air or inert gas. The purpose of so introducing air or an inert gas is to improve the tenderness, palatability and the digestibility of the resultant food product. Where air or an inert gas is introduced as described above the emulsion may have an over-run of, say, up to 100%, which means that in the emulsion 50% of the bulk thereof is constituted by air or inert gas.

The emulsion, which has substantially the consistency of a homogeneous pulp and which, if air or an inert gas has been added, is in the form of a whipped cream, is then pumped into elongated tubular casings formed of high slip polyethylene. The temperature of the emulsion within the casings is thereafter lowered to render the emulsion in a frozen or semi-frozen state, this preferably, although not necessarily, being achieved by freezing the emulsion, for example, by cooling the emulsion to a temperature within the range -10°F to 0°F by a quick freezing process which may be conventional in character, and then tempering the frozen emulsion within the casings to a temperature within the range 25°F to 35°F , and preferably within the range 28°F to 35°F , at which stage the emulsion is in a frozen or semi-frozen state. The above-described step of freezing the emulsion to, for example, a temperature within the range -10°F to 0°F serves, because of the rapid lowering of the temperature of the emulsion, to inhibit bacterial growth in the emulsion, the subsequent tempering of the frozen emulsion serving to reduce the hardness of the emulsion thereby to facilitate dicing of the emulsion. As will be understood, the emulsion when in the frozen condition at a temperature of, for example within the range -10°F to 0°F may

be stockpiled for indefinite periods to meet future production requirements.

The meat emulsion is considered to be semi-frozen when in such a state that although frozen and sufficiently stiff that, when diced, the lumps of emulsion substantially retain their form it nevertheless has a degree of softness.

The frozen or semi-frozen emulsion is diced after being removed from the tubular casings, the emulsion dices preferably each being of substantially cubical form having length, breadth and height dimensions within the range $1/8$ inch to $3/4$ inch, and preferably of the order of $1/4$ inch, although it is to be understood that the scope of the invention is not restricted to embodiments in which the emulsion dices are of cubical form but includes embodiments in which the emulsion is cut or chopped into lumps of substantially any shape.

The diced, frozen or semi-frozen emulsion is canned, or packed in glass containers, with a hot edible liquid or gravy, which is preferably constituted by a gravy containing a major proportion of water together with a thickening agent, such as flour, seasoning, and, if desired, artificial or natural colouring, the diced emulsion being covered with the gravy. Preferably, the canning or packing operation, which may be of the conventional character for products of the type in question, comprises the steps of partially filling each can or glass container with the hot gravy, introducing the appropriate quantity of the diced, frozen or semi-frozen emulsion into the can or glass container, and topping up the can or glass container with a further quantity of the hot-gravy.

The hot gravy, which is at a temperature of at least 190°F , and preferably at a temperature within the range 190°F to 212°F , causes heat setting of the protein material, such as the myosin, in the outer surfaces of the emulsion dices thereby to form a skin around the dices which substantially prevents disintegration and agglomeration of the dices. The cans or glass containers are then sealed and the sealed cans or glass containers are heated, by for example being passed through a retort, to cause cooking of the emulsion dices and sterilization of the diced emulsion and gravy within the cans or glass containers. The heating of sealed cans or glass containers in a retort for these purposes is well known in the art and the time and temperature factors to ensure proper cooking and commercial sterilization may readily be determined by standard test procedures.

Finally, the cans are cooled and are then stored in the normal manner. The food product may be used in the cold condition or after being heated, either by heating the unopened cans and then opening the cans and removing the contents for consumption or by

opening and emptying the cans into, for example, a saucepan or the like in which the food product is then heated. In the resultant heated meat food product which the consumer uses the diced meat emulsion is substantially in the form of discrete, integral lumps, such a meat food product being much more acceptable to the consumer than products in which the emulsion dices have disintegrated. For example, a meat food product can be much more readily assimilated by cats if the meat is substantially in the form of discrete, integral lumps. Likewise, in relation to meat food products for human consumption the consumer generally prefers the meat to be in the form of discrete, integral lumps which are free from striated muscle or connective tissue and which can therefore be more rapidly digested, the starches being so digested first.

By way of example, a food product produced by a process according to the present invention may be constituted as follows, the percentages quoted all being percentages by weight.

	Meat (including byproducts thereof)	45%
	Meat binding agent	4.5%
	Vitamin and mineral supplement	0.5%
30	Water	47%
	Thickening agent	2%
	Seasoning	1%
		<hr/> 100%

WHAT WE CLAIM IS:—

1. A process for producing a food product, the process comprising the steps of finely comminuting meat to form an emulsion having substantially the consistency of a pulp, lowering the temperature of the emulsion to render the emulsion in a frozen or semi-frozen state, dicing the frozen or semi-frozen emulsion, covering the diced, frozen or semi-frozen emulsion with an edible liquid having a temperature of at least 190°F thereby to heat set the protein material in the outer surfaces of the emulsion dices, and subsequently cooking the diced emulsion.

2. A process as claimed in claim 1 wherein the frozen or semi-frozen emulsion is at a temperature within the range 25°F to 35°F during the dicing thereof.

3. A process as claimed in either one of the preceding claims wherein the diced emulsion together with the edible liquid is canned or packed in glass containers prior to the cooking of the diced emulsion, the cans or glass containers are then sealed, and the sealed cans or glass containers are subjected to heat to cause said cooking of the diced emulsion and to sterilize the diced emulsion and edible liquid within the cans or glass containers.

4. A process as claimed in any one of the

preceding claims, wherein the step of finely comminuting the meat comprises the steps of grinding the meat and then passing the ground meat through an emulsifying unit to form the emulsion, a proportion of air or inert gas being added to the emulsion in the emulsifying unit.

5. A process as claimed in any one of the preceding claims, wherein the emulsion includes a meat binding agent.

6. A process as claimed in claim 5, wherein the meat binding agent is constituted by milk powder or a cereal binder.

7. A process as claimed in claim 4, wherein the meat is at a temperature within the range 30°F to 40°F during the grinding thereof.

8. A process as claimed in any one of the preceding claims, wherein the lowering of the temperature of the emulsion comprises the steps of freezing the emulsion, and then tempering the frozen emulsion to a temperature within the range 28°F to 35°F.

9. A process as claimed in any one of claims 1 to 8, wherein the lowering of the temperature of the emulsion comprises the steps of rapidly cooling the emulsion to a temperature within the range -10°F to 0°F, and then tempering the frozen emulsion to a temperature within the range 28°F to 35°F.

10. A process as claimed in any one of the preceding claims, wherein the emulsion contains a major portion by weight of water.

11. A process as claimed in any one of the preceding claims, wherein the emulsion contains between 65% and 80% by weight of water.

12. A process as claimed in any one of the preceding claims, wherein the meat when initially comminuted is completely uncooked.

13. A process as claimed in any one of the preceding claims, wherein the emulsion dices are each of substantially cubical form having length, breadth and heat dimensions within the range 1/8 inch to 3/4 inch.

14. A process as claimed in any one of the preceding claims, wherein a proportion of the meat is constituted by meat by-products.

15. A process as claimed in any one of the preceding claims, wherein the emulsion contains an emulsifying agent or agents.

16. A process of producing a food product, the process comprising the steps of grinding uncooked meat and then passing the ground meat, together with a meat binding agent, through an emulsifying unit to form an emulsion having substantially the consistency of a pulp and containing between 65% and 80% by weight of water, lowering the temperature of the emulsion to within the range 28°F to 35°F thereby to render the emulsion in a frozen or semi-frozen state, dicing the frozen or semi-frozen emulsion, canning or packing in glass containers the diced, frozen or semi-frozen emulsion with an edible liquid having a temperature of between 190°F and 212°F

thereby to heat set the protein material in the outer surfaces of the emulsion dices, sealing the cans or glass containers, and subsequently heating the sealed cans or glass containers in a retort to cook the diced emulsion and to sterilize the diced emulsion and edible liquid within the cans or glass containers.

5 17. A process of producing a food product, the process being as hereinbefore described
10 with reference to, and as illustrated in, the accompanying drawing.

18. A food product when produced by a process as claimed in any of claims 1 to 17.

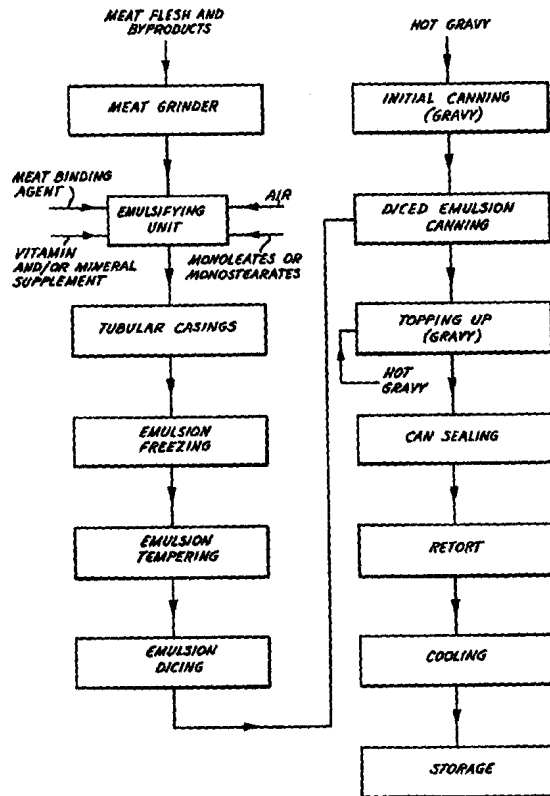
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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of
the Original on a reduced scale



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54 **Process for aseptically packaging a multi-component food product.**

57 A process for aseptically packaging a food product containing discrete pieces of a solid food component and a fluid food component comprises: depositing solid food component into an open container; contacting the open container and its contents with steam for a period of time sufficient to sterilize both; depositing a sterilized fluid food component into the container; and sealing the container under aseptic conditions. In a preferred embodiment, fully-cooked pasta is placed in a plastic container and sterilized therein prior to depositing a sterilized, cooled cheese sauce thereover and aseptically sealing.

EP 0 570 122 A2

Technical Field

The invention relates to aseptic packaging, and especially to an improved process for aseptically packaging a food having solid as well as fluid components.

To be stable against spoilage during room-temperature storage, foods must be sterilized. This usually entails retorting or otherwise treating a food to kill essentially all microorganisms. For retorting to provide effective protection for a packaged food, the whole package must be retorted until the entire contents is raised to at least a minimum temperature and held there for a designated period of time. This assures not only complete processing of all portions of the product, but overprocessing of a significant portion of it.

To overcome the problem of overprocessed food, the art has identified a number of techniques such as aseptic packaging. In aseptic packaging, the food is typically sterilized prior to sealing in the container. This enables cooking the food uniformly to near the optimum degree and avoids the gross overcooking so common to "canned goods". However, these problems have not been fully overcome for multi-component food products, e.g. those comprised of fluid and solid components. These products will often require different cooking conditions for each of the various components. Sometimes, cooking the components in the presence of each other will adversely affect one or more of the components.

Background Art

The art of aseptic canning has improved the quality of a wide range of food products, especially those having a relatively homogeneous consistency. Processing large quantities of foods having both liquid and solid components has posed problems in retaining the quality of the solid food components.

In U.S. Patent No. 3,437,495, M. R. Jeppson discloses separately sterilizing liquid and solid components before packaging them together in a sterile container under aseptic conditions. The solid component is subjected to microwave heat while the liquid is separately sterilized in a heat exchanger. The cans are sterilized unfilled. As disclosed by D. W. Pohorski in U.S. Patents No. 4,415,539 and No. 4,495,974, both steam and hot air are effective for this purpose. In U.S. Patent No. 4,522,015, W. M. Hildebolt discloses an aseptic sterilization and packaging process wherein solid and liquid components of a food product are sterilized separately. The solid component is sterilized by placing it in the can, temporarily sealing the can, heating, opening the can, adding cooled sterilized liquid to the solids in the can, and finally sealing the can. In U.S. Patent No. 5,085,882, H. Rausing discloses an aseptic packaging method wherein a com-

bined particulate and liquid stream is heated, and a stream with a high liquid content is separated, cooled and admixed with the remainder which is high in particulates. The combined stream is then fed to a packaging machine.

It would be desirable to have a process which would simplify the aseptic packaging of multi-component foods while maintaining high quality for each of the components.

Disclosure of Invention

It is an object of the invention to provide an improved process for aseptically packaging a multi-component food product while maintaining high quality for each of the components.

It is another object of the invention to provide an improved process for aseptically packaging a multi-component food product comprising a starch-based solid component and a fluid component.

It is another object of the invention to provide an improved process for aseptically packaging a multi-component food product having a solid component and a congealable fluid component.

These and other objectives are accomplished by the present invention which provides a process for aseptically packaging a food product containing discrete pieces of a solid food component and a fluid food component, the process comprising: depositing at least a portion of, and typically all of, the solid food into an open container; contacting the open container and its contents with steam for a period of time sufficient to sterilize both; depositing a sterilized fluid food component into the container; and sealing the container under aseptic conditions.

Brief Description of the Drawing

The invention will be better understood and its advantages will be more fully appreciated from the following detailed description, especially when read in light of the accompanying drawing wherein:

The Figure is a schematic representation of a preferred process scheme.

Detailed Description

The description which follows will center on the processing of a multi-component food product, macaroni and cheese, which is particularly in need of the improvement of the invention. The cheese component must be processed within a rather narrow range of conditions to assure sterilization without overcooking which can cause color and flavor changes. The macaroni product should be cooked to a desired texture and not overcooked to become flacid with starch loss to the cooking liquid. It is important to cook the pasta separately from the cheese sauce to achieve

the desired degree of cooking while preserving the distinct flavors of the two components and preventing starch from the macaroni from being incorporated into the sauce. It will be understood, however, that the invention contemplates the processing of any two or more food components and aseptically packaging them.

The solid food component can be any particulate food which is cut, shaped or naturally occurs in pieces which can fit loosely within a container, and as such are capable of sterilization with the application of steam. The solid food can be a member selected from the group consisting of pasta, vegetables, meat, fruit and combinations of two or more of these. Within the pasta category are noodles, as well as spaghetti, linguine, lasagna, macaroni, and the like. Among the fruits and vegetables are those which are whole, sectioned, or cut up, whether peeled or unpeeled. The meat can be seafood, fowl, red meat, sausage, meatballs, meat loaf, mixtures of these, and the like pieces. In each case, the pieces may be the whole article where small enough, like peas, rice, or tiny shrimp, or can be any sized portion, like split peas, macaroni or cubes of ham.

The fluid food component will typically be what is known as a broth or a sauce. It can be truly homogeneous or can include suspended particulates, globules or the like. Typical of the broths are those prepared from meats and/or vegetables including those from meats such as beef, pork, lamb, chicken, and the like. Typical of the sauces are those prepared from ingredients selected from the group consisting of tomato, cheese, vegetable puree, and the like. The broths and sauces can include thickeners such as starch or the like. Finely-divided vegetable fat or meat material can be suspended in the fluid component for body, mouthfeel or flavor.

Reference is now made to the Figure to aid in describing a preferred process scheme according to the invention. The drawing shows empty containers 10 being fed to an aseptic packaging line 20 and being discharged from it as sealed containers 12 at the end of the line. The process of the invention is highly simplified yet results in products of very high quality.

Solid ingredient is prepared in vessel 22. This typically entails cooking, such as in the case of pasta, vegetables, meat, or the like, or simply blanching in the case of some vegetables. The preparation is usually intended to cook the solid food component to near the desired degree, with the remaining cooking to be accomplished during sterilization as will be described later. Most preferably, this component is fully cooked and/or hydrated at this stage with little or no hydration occurring later.

The prepared solid food can be delivered by suitable conduit or other transport means to a container 10 which is delivered to and supported on conveyor 24, here shown as a belt. Any means effective to con-

vey the containers can be employed. They can be indexed or fed continuously as dictated by the particular production circumstances. Devices of the type described in the above-referenced patents to Pohorski (James Dole Corporation) can be employed, but steam or humidified air are preferred to dry air as disclosed therein to avoid drying of the solid component. The preferred process will employ superheated culinary steam to effectively supply the necessary heat to achieve the target sterilization temperature.

The containers can be glass, metal, plastic, coated fiberboard, or any suitable combination of these. Preferred for many purposes are plastic containers of co-extruded stock, e.g. having a material such as polypropylene on the surface in contact with the food, a barrier layer of a material such as ethyl vinyl alcohol, and an external surface layer of a material such as polypropylene (regrind). One especially suitable container comprises polypropylene/tielayer/barrier/tielayer/virgin polypropylene.

Following depositing the solid food component pieces into the containers 10 via line 26, the containers are passed into pressurized chamber 28 wherein steam with or without heated air is injected by suitable inlets 30 to increase the temperature to a level effective when held for a time effective to sterilize the open containers and their contents. Where desired, the steam or mixture of steam and air can be directed at the container contents to force unsterile air out and create turbulence to assure effective heat transfer. Typically, in the case of culinary steam (made with FDA approved boiler chemicals, free of dirt, metals and other contaminants), a product such as cooked macaroni is heated to from about 220° to about 250°F (about 104.4° to about 121.1°C) and held there for about 10 to 15 minutes, preferably about 12 minutes. Essentially complete kill of pathogenic as well as spoilage organisms is achieved. Shelf-temperature-stable storage for at least one month and preferably at least three is preferred. Typical commercial storage times are in the range of three to eighteen months. A preferred level of kill will be a 5 D (5 log cycle) reduction. Here D value is 1.5 minutes for commercial sterility.

After sufficient processing, a sterile fluid food component is fed from vessel 32, through conduit 34 and into sterilized container 10. To avoid further cooking of the solid food ingredient and to achieve efficient product cooling, the fluid food component is preferably cooled by passage through heat exchanger 36. The degree of cooling will be consistent with process requirements and should not be so extreme as to unduly increase the viscosity of the fluid component.

The fluid component will typically have a major amount of water with enough other liquid materials to make it fluid under conditions of processing and consumption. Fillers and thickeners can also be employed. In the case of cheese sauces, they will typi-

cally contain from 20 to 60% water, from 8 to 25% cheese solids (e.g. cheddar), from 2 to 4% starch, salt, sugar, monosodium glutamate and seasonings. Tomato sauces can be employed such as those prepared from pureed whole tomatoes with seeds removed and spices added.

From filler 34, the containers are passed to a sealing station where a sterile lid 38, from stack 40, is employed to cover the open, filled container. Sealing means 42 effects a complete seal of the lid to the container, the nature of the seal depending on the construction of both the lid and the container. An adhesive can be employed as necessary. In the case of polypropylene containers and metal lids, sealing is effected by double seam crimp action.

Following sealing, the containers are further cooled and packaged. For congealable fluids such as cheese sauce, the invention includes the step of agitating the containers to effect mixing of the fluid and solid food components. This can be achieved by any movement of the container which will move the contents sufficiently to at least contact substantially all solid component exterior surfaces with the fluid component. Agitation by vibration, rotation or translation can be effective. Preferably, the containers are rotated about at least one axis extending through the container between the container top and bottom. Preferably, rotation is about at least two axes.

The following Example is provided to further illustrate and explain a preferred form of the invention and is not to be taken as limiting in any regard. Unless otherwise indicated, all parts and percentages are by weight.

EXAMPLE

Pasta noodles (elbow macaroni) are blanched to achieve complete hydration (e.g., at 212°F (100.0°C) for approximately 10 minutes) then drained. Drained, blanched noodles are then poured into 7-8 ounce (207.0-236.6 ml) polypropylene cups. The cups, which are lined with polypropylene and have an impervious barrier layer, containing the blanched noodles are then passed through a "Dole" type pressurized aseptic tunnel and exposed to super-saturated (culinary) steam at about 250°F (about 121.1°C) for approximately 10-15 minutes. Cheese sauce prepared from the following recipe.

Ingredient	Parts
Whole Milk	48.00
Water	34.87
Margarine	6.25
Cheese Powder	4.50
Thickeners	3.50
Disodium Phosphate	0.94
Sucrose	0.75
Salt	0.65
Monosodium Glutamate	0.25
Sodium Hexametaphosphate	0.19
Color and Flavor	0.10

is sterilized through a contherm system at about 280°F (about 137.8°C) for about 15 seconds and cooled to 100°F (37.8°C). Following sterilization, the sauce is then aseptically filled into the sterilized cups containing the sterilized noodles. The sterilized cups containing sterilized noodles and cheese sauce are then aseptically sealed with a "can type" metal lid, constructed of polyolefin extrusion-coated aluminum, by Central States Co. The noodles and sauce are present at a weight ratio of about 45 to 55. Sealed cups are then removed from the sterile sealing chamber and rotated several times to mix the noodles and cheese sauce together.

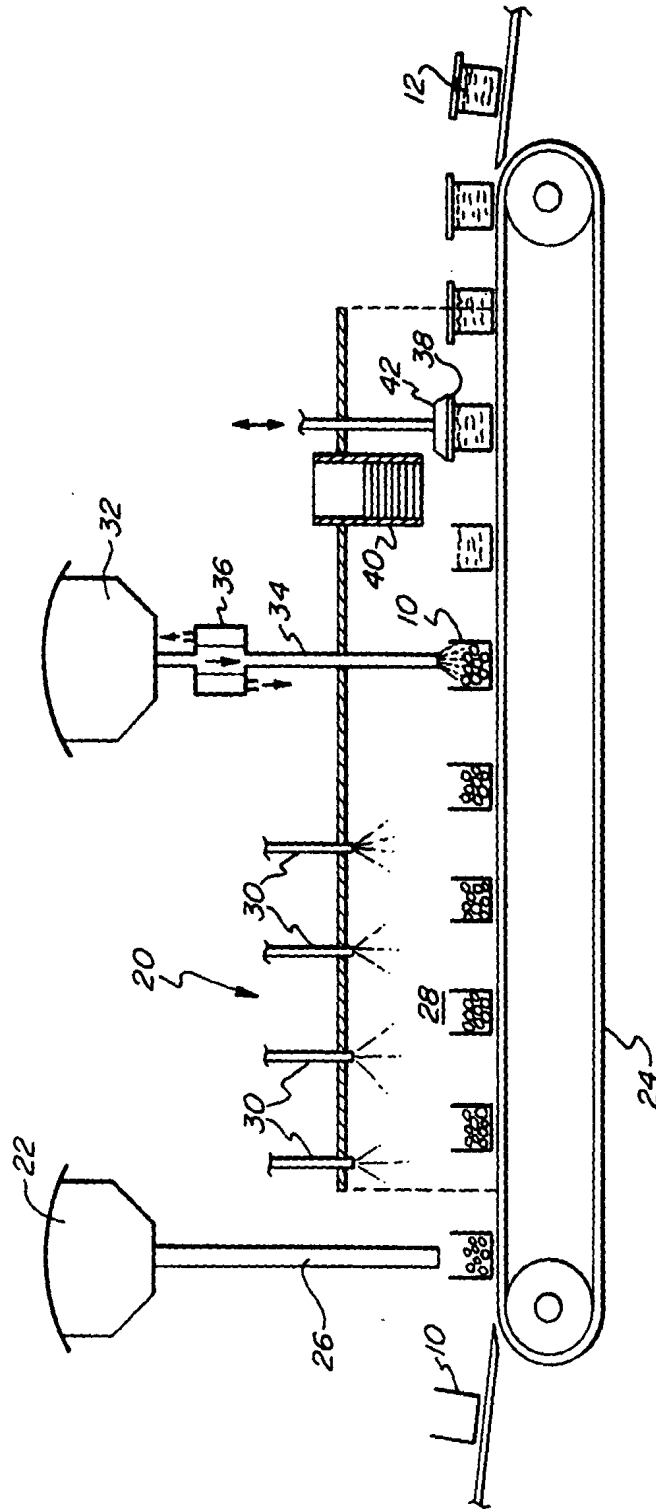
The above description is for the purpose of teaching the person of ordinary skill in the art how to practice the present invention, and it is not intended to detail all of those obvious modifications and variations of it which will become apparent to the skilled worker upon reading the description. It is intended, however, that all such obvious modifications and variations be included within the scope of the present invention which is defined by the following claims. The claims are meant to cover the claimed elements and steps in any arrangement or sequence which is effective to meet the objectives there intended, unless the context specifically indicates the contrary.

Claims

1. A process for aseptically packaging a food product containing discrete pieces of a solid food component and a fluid food component, the process comprising:
 - depositing at least a portion of the solid food component into an open container;
 - contacting the open container and its con-

- tents with steam for a period of time sufficient to sterilize both;
 depositing a sterile fluid food component into the container; and
 sealing the container under aseptic conditions. 5
2. A process according to claim 1 which further includes the step of placing a sterile cover over the open container after the fluid food component has been deposited therein. 10
3. A process according to claim 1 or claim 2, wherein the solid food is cooked prior to depositing it into the open container. 15
4. A process according to any one of claims 1 to 3, wherein the solid food component comprises fully hydrated pasta. 20
5. A process according to any one of claims 1 to 4, which further comprises the step of agitating the container to effect mixing of the fluid and solid food components. 25
6. A process according to claim 5, wherein the containers are agitated by rotating about at least two axes and the container is then cooled to congeal the fluid food component. 30
7. A process according to any one of claims 1 to 6, comprising:
 depositing the solid food component into an open container; 35
 contacting the open container and its contents with steam for a period of time sufficient to sterilize both;
 heating the food sauce sufficiently to render it fluid and to sterilize it; 40
 depositing the food sauce into the container;
 sealing the container under aseptic conditions;
 agitating the container to effect mixing of the sauce and the solid food component; and 45
 cooling the container effectively to congeal the sauce.
8. A process according to claim 7, wherein the food sauce is a cheese sauce. 50
9. A process according to claim 7 or claim 8, wherein the food sauce is cooled prior to depositing it into the container. 55
10. A process according to any one of claims 1 to 9, wherein the container comprises an inner layer of polypropylene, a barrier layer, and an outer layer

of polypropylene and the lid comprises polyolefin extrusion-coated aluminium.



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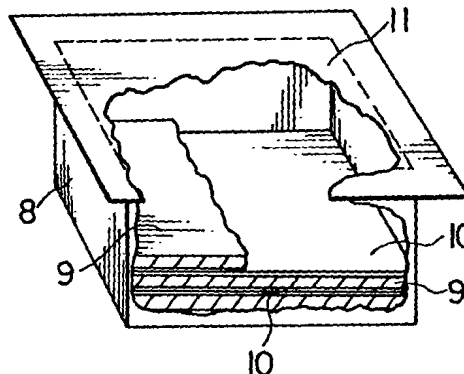
(54) Composition for forming a
sheet of a food

(57) A composition for a sheet form
food comprises a material such as a
spread, concentrated sauce or the
like and at least one thermally
reversible gelling agent, e.g. gelatin
or carrageenan.

A sheet form food is formed of
said composition by moulding the
composition in a container to a
sheet form.

A package comprises said sheet
form food (9) received in a plurality
of layers one upon another with a
film (10) interposed between each
adjacent upper and lower layer
within said container (8).

FIG. 3



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FIG. 1

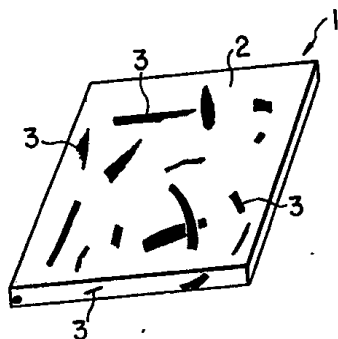


FIG. 2

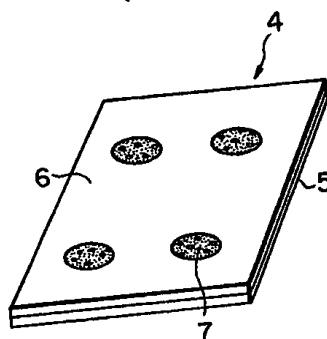


FIG. 3

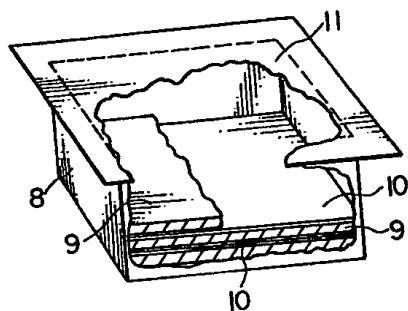


FIG. 4

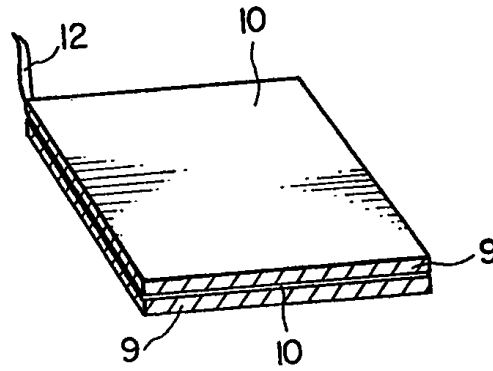
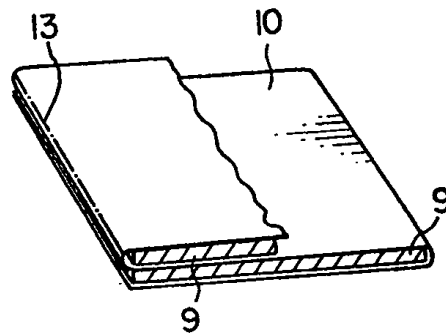


FIG. 5



SPECIFICATION

Composition for forming a sheet of a food, and sheets formed therefrom and packages thereof

- 5 This invention relates to compositions for sheet form foods such as subsidiary foods to be applied to bread, crackers and the like, sheet food formed of the compositions and packages containing the sheet food. 5
- 10 Of late, bread, crackers and the like have been increasingly eaten as breakfasts and snacks between luncheons and suppers. In order to impart variety to the taste, external appearance and fragrance of bread, crackers and the like, concentrated sauces, spreads and the like have been conventionally employed. 10
- 15 However, spreads, concentrated sauces and the like have to be manually applied to bread, crackers and the like by the use of an implement such as a knife and the like and such manual application spends a substantial time. And the implement such as a knife and the like has to be cleaned each time the implement has been used and the cleaning is a quite troublesome work. 15
- 20 Furthermore, since the concentrated sauces, spreads and the like are manually applied to bread, crackers and the like, the amount of the subsidiary foods such as the sauces, spreads and the like to be applied to the staple foods such as bread, crackers and the like varies each time the subsidiary foods are applied to the staple foods and it is not assured that the subsidiary foods are always applied in uniform amount or thickness to the staple foods. 20
- 25 Therefore, in order to eliminate the drawbacks inherent in the conventional subsidiary foods for bread, crackers and the like referred to hereinabove, there has been a strong demand for subsidiary foods to be applied to bread, crackers and the like which can be eaten by being solidified and then placed on the staple foods or being heated to viscous or liquid state and then applied to the staple foods. As subsidiary foods for bread, crackers and the like which meet the demand, foods such as butter, margarine, cheese and the like which are usually applied to the staple foods have been known. However, the conventional subsidiary foods are limited to those which have their property capable of solidifying by themselves. 25
- 30 In the above-mentioned situation, we have conducted strenuous studies on spreads, concentrated sauces and the like which have no inherent property capable of solidifying by themselves in order to obtain sheet form foods which meet the above-mentioned demand from such subsidiary foods and have now found that the sheet form subsidiary foods can be obtained by adding thermally reversible gelling agent or agents to the conventional subsidiary foods. 30
- 35 That is, the gist of the present invention resides in compositions for sheet form foods which comprise spreads, concentrated sauces and the like having thermally reversible gelling agent or agents incorporated therein. 35
- The present invention will be now described in detail.
- 40 First of all, spreads, concentrated sauces and the like referred to in the present invention are subsidiary foods which can be eaten by being applied to bread, crackers and the like. Such subsidiary foods are, for example, pizza sauce, ketchup, mustard, mayonnaise, tartare sauce, custard sauce, jam, marmalade, custard cream, white sauce, cream and dressing and furthermore, yolk, vegetable oil and vinegar having emulsifying agent added thereto and suitably seasoned and flavoured yolk, vegetable oil and vinegar. 40
- 45 Sheet form foods of the present invention are obtainable by adding thermally reversible gelling agent or agents to the above-mentioned spreads and sauces and moulding the resulting mixture to a sheet form. The shape of the sheet form food is not limited to any specific one and may be circular, rectangular or any suitable ones provided that the sheet form food can be placed on bread, crackers or the like. 45
- 50 The above-mentioned thermally reversible gelling agents are those which present gel state by cooling and sol state by heating and such thermally reversible gelling agents are, for example, gelatin, carrageenan, pectine and agar-agar. According to the present invention, one or more of the gelling agents are selectively employed. The thermally reversible gelling agent or agents may be employed in conjunction with a viscosity enhancer, if desired. The thermally reversible gelling agent or agents are incorporated into the spread, concentrated sauce or the like and the resulting mixture is moulded to a sheet form subsidiary food. The sheet form subsidiary food is placed on bread, cracker or the like and can be eaten together with the staple food with the sheet form subsidiary food maintained in its solidified state. The subsidiary food may be also rendered viscous or liquefied by heating and applied to the staple food in its viscous or liquid state to be eaten therewith. And according to the present invention, since the composition for sheet form subsidiary food is not solidified by fat and oil and the thermally reversible gelling agent or agents employed are tasteless and odorless, the subsidiary food does not affect the inherent taste and fragrance of the staple food to which the subsidiary food is applied. The amount of the thermally reversible gelling agent or agents in the composition for any sheet form food according to the present invention is preferably within the range of 1-20% by weight 50
- 55 60 65 55 60 65

- based on the total weight of the composition. If the amount of the thermally reversible gelling agent or agents is below 1% by weight, the obtained sheet form food will tend to have an insufficient shape-holding capability. On the other hand, the amount of the thermally reversible gelling agent or agents in the sheet form food composition is above 20% by weight, when the
- 5 sheet form food is applied to the staple food in its viscous or liquid state by being heated and eaten together with the latter with the sheet form food maintained in its viscous or liquid state, the subsidiary food gives sticky feeling th the eater's mouth. Furthermore, when the staple food with the subsidiary sheet form food applied thereto is not eaten immediately after heating of the subsidiary food, the subsidiary food tends to form gel again in a brief time. 5
- 10 The applications of sheet form foods of the present invention will be now described. 10
- In one application, any one of the inventive sheet form foods contains one or more members in an optional material group or has such member or members placed thereon, in another application, another inventive sheet form food is laminated on the first-mentioned inventive sheet form food and in a further application, either one of the first- and second-mentioned
- 15 inventive sheet form foods has an oil system edible ingredient comprising a predominant amount of fat and oil such as cheese, butter or margarine laminated thereon. 15
- When the oil system edible material such as cheese, butter or margarine is laminated on the sheet form food, as the material for the sheet form food, among the spreads, concentrated sauces and the like, a water system edible material comprising a predominant amount of water
- 20 such as pizza sauce is preferably employed in conjunction with the oil system edible material. Since the sheet form food material is of water system and the ingredient to be laminated thereon is of oil system and the two types of materials are solidified prior to application thereof to the staple food, the taste, color and fragrance inherent in the water system material and those inherent in the oil system material would not easily transfer to each other. As a result, even after
- 25 the sheet form food has been stored for a long period of time, the inherent tastes, colors and fragrances of the sheet form food and optional material would not be adversely affected. 25
- According to one aspect of the present invention, there is provided a composition for a sheet form food which comprises one of spread, concentrated sauce and the like and at least one thermally reversible gelling agent.
- 30 According to another aspect of the present invention, there is provided a sheet form food which comprises one of spread, concentrated sauce and the like having at least one thermally reversible gelling agent added thereto and moulded in a mould. 30
- According to a further aspect of the present invention, there is provided a package which comprises a container and a composition comprising one of spread, concentrated sauce and the
- 35 like and having at least one gelling agent added thereto, said composition being solidified within said container by cooling the container. 35
- The above and other objects and attendant advantages of the present invention will be more readily apparent to those skilled in the art from a reading of the following detailed description in conjunction with the accompanying drawings which show preferred embodiments of the
- 40 invention for illustration purpose only, but not for limiting the scope of the same in any way. 40
- Figure 1 is a perspective view of a sheet form food having chips of an optional material embedded therein embodying the present invention;
- Figure 2 is a perspective view of another sheet form food having cheese laminated thereon and an optional material embedded therein embodying the present invention;
- 45 Figure 3 is a perspective view of a package which comprises a container and the inventive sheet form food contained in a plurality of layers in the container embodying the present invention with a portion thereof broken away; 45
- Figure 4 is a perspective view of a sheet form food having a film interposed between two layers of the sheet food embodying the present invention; and
- 50 Figure 5 is a perspective view of another sheet food having a film interposed between two layers of the sheet food embodying the present invention. 50
- The present invention will be now described referring to the accompanying drawings and more particularly, to Fig. 1 thereof in which a sheet form food having chips of one or more members in an optional material group embedded therein embodying the present invention is
- 55 illustrated. The sheet formfood 1 comprises a sheet form proper 2 and chips 3 of one or more members in the optional material group. 55
- The sheet form food proper 2 has been formed by adding one or more thermally reversible gelling agents to the composition for the sheet form food proper 2 which is formed of one member selected from the group consisting of the above-mentioned spreads, concentrated
- 60 sauces and the like and moulding the resulting mixture to a sheet form. The shape of the sheet form food proper 2 is not limited to any specific one, but may be rectangular, circular or any other configuration. 60
- The members in the optional material group 3 include, for example, meats exemplified by ham, sausage and corned beef; fishes exemplified by tuna and the like; vegetables exemplified by
- 65 onion, Spanish paprika, carrot and potato; beans exemplified by corn and the like; nuts 65

exemplified by walnut and the like; mushrooms; fruits; eggs; and these members having suitable seasoning and fragrant agents added thereto. The optional material member or members are embedded in the sheet form food proper in the moulding of the latter.

Referring now to Fig. 2, there is illustrated a sheet form food 4 which comprises a sheet form food proper 5, a cheese layer 6 laminated on one side of the food proper and an optional material member 7 which in the form of a disc placed on either one of the sheet food proper and cheese layer 5, 6 as desired. The optional material member 7 may be one or more selected from the above-mentioned optional material group. As in the case of the embodiment shown in Fig. 1, the sheet food proper 5 is formed by adding one or more members selected from the above-mentioned thermally reversible material group to spread, concentrated sauce or the like and cooling the resulting mixture to provide a sheet form food proper.

From the reason described hereinabove, the spread, concentrated sauce or the like to be used is preferably a water system one.

The sheet form food proper 5 is not limited to any specific shape, but may be rectangular, circular or any other shape.

The cheese layer 6 may have any suitable shape, such as rectangular, circular, strip-like, net-like or bar like, for example.

As mentioned hereinabove, since the sheet form food proper 5 and cheese layer 6 are laminated on another in the sheet form food 4, even when the sheet form food is melted down by heating, the spread, concentrated sauce or the like constituting the sheet form food proper and the cheese will not easily admix together which would otherwise occur when the sheet form food proper has the cheese embedded therein. As a result, the obtained sheet form food 4 has an external appearance which improves one's appetite.

The applications of the inventive sheet foods have been described.

Now, the types of packages containing the inventive sheet form foods therein will be described.

The inventive sheet form foods are preferably handled in packages from the view point of preservation thereof. In one package type for the inventive sheet form foods, the sheet form food is received in a single layer within a container, in another package type, the inventive sheet form food is received in a plurality of layers within a container and in a further package type, the inventive sheet form food is enclosed by a single thin film. When the inventive sheet form food is received in a container, it is preferable that the sheet form food is received in a container formed of thin synthetic resin sheet and the container is then vacuum sealed. The vacuum sealing has the advantage that even when the sheet form food is rendered to viscous or liquid state subjected to heat-sterilization treatment, the spread, concentrated sauce or the like constituting the sheet form food proper and the cheese will be prevented from admixing together because it is presumed that the cheese and spread, concentrated sauce or the like which is in viscous or liquid state cannot freely migrate.

Package types in which the inventive sheet form food is received in a plurality of layers within containers will be now described referring to Figs. 3, 4 and 5. Fig. 3 is a perspective view of one embodiment of the package with a portion thereof cut away showing the inventive sheet form food received in a plurality of layers within a container and Figs. 4 and 5 are perspective views of two inventive sheet form foods in which a film is interposed between two adjacent layers of the inventive sheet form food, respectively.

First, referring to Fig. 3, reference numeral 8 denotes a container which is adapted to receive the inventive sheet form food 9 in a plurality of layers placed one upon another and the shape and size of the container may be of any suitable one provided that the sheet form food can be easily placed in and removed out of the container. The container 8 may have a cup or cylindrical shape other than the box shape as shown in Fig. 3. Although the horizontal cross-sectional configuration of the box shape container 8 is not limited to that as shown in Fig. 3 adapted to receive the inventive sheet form food 9 in a plurality of layers, the horizontal cross-section configuration of the container is preferably identical with or similar to that of the inventive sheet form food 9.

Although the material of the container 8 is not limited to a specific one, provided that the container can suitably receive the inventive sheet form food, when the package is adapted to be subjected to high temperature such as heat-sterilization treatment or the like, the container should be formed of heat resistant material. For this purpose the container is preferably formed of polypropylene or polyethylene, for example. The container may be formed of a plurality of layers of such material. In such a case, an intermediate layer having a gas barrier property such as ethylenevinyl acetate copolymer saponification product or vinylidene chloride is interposed between adjacent layers of the container from the view point of preservation of the content.

The container 8 receives the inventive sheet form food 9 in a plurality of layers with a film interposed each adjacent layers. The opening of the container 8 is normally closed by a cover member 11.

The film 10 should have the shape and size identical with or substantially similar to those of

each of the sheet form food layers. Furthermore, the film 10 is preferably easily separable from the sheet form food. When the package containing the sheet form food is adapted to be subjected to high temperature such as heat-sterilization treatment or the like, the film 10 is preferably formed of material which exhibits low thermal contraction. Materials which meet the requirement are, for example, polyester and polyethylene.

Furthermore, when the film 10 has the shape and size identical with or substantially similar to those of each of the layers of the sheet form food 9 as described hereinabove, the film 10 may be interposed between each adjacent layers of the sheet form food 9 as shown in Fig. 4 or an indefinite length of the film 10 may be first interposed between selected adjacent sheet form food layers as shown in Fig. 5. In the case of the embodiment as shown in Fig. 4, the film 10 is preferably provided with an ear 12 for pulling the food layer or layers out of the container. And in the embodiment as shown in Fig. 5, the indefinite length of film 10 is scored at 13 so that the rest of the film 10 which is not interposed between the adjacent food layers is removed after the food layer or layers have been taken out of the container.

As mentioned hereinabove, by the interposition of the film 10 having the shape and size identical with or similar to those of each of the layers of the sheet form food, the adjacent sheet form layers are prevented from directly contacting each other or the contact area between the adjacent sheet form food layers can be minimized. As a result, the adhering between adjacent sheet form food layers can be effectively prevented whereby the sheet form food layers can be taken out of the container one at one time.

The package containing the inventive sheet form food therein is preferably subjected to heat-sterilization treatment from the view point of preservation of the sheet form food therein. In such a case, although sterilization conditions vary depending upon the type and shape of the sheet form food to be treated, as one example, the central package area temperature of 70–110°C for 3–10 minutes are sufficient for sterilization.

When the inventive package containing the sheet form food is subjected to heat-sterilization treatment, since the sheet form food has the thermally reversible property, the food layers can maintain their proper sheet form. That is, even when the sheet form food melts down by the heat sterilization treatment to become liquid or paste state, since the film having the shape and size identical with or substantially similar to those of the sheet form food layers is interposed between the adjacent food layers, the food layers will not merge into a single mass. Thus, the sheet form food layers can regain their sheet state upon cooling for solidification. In such a case, the size of the film may be somewhat smaller or larger than that of the sheet form food layers. As mentioned hereinabove, when the shape and size of the film are made identical with or substantially similar to those of the sheet form food layers, after the heat-sterilization treatment, the sheet form food layers can regain their original shape and size prior to the heat-sterilization treatment.

When it is contemplated that the package containing the inventive sheet form food therein is subjected to heat-sterilization treatment, the package is preferably evacuated prior to such treatment whereby formation of small holes in the surface of the sheet form food can be prevented when the food solidifies by cooling. On the other hand, if the evacuation is not made on the package prior to heat-sterilization treatment, by the presence of air within the package container, such small holes are inevitably formed in the surface of the sheet form food upon solidification by cooling. As a result, absence of the small holes can effectively prevent deterioration of the external appearance of the sheet form food.

Thus, the present invention has succeeded in providing sheet form foods by adding thermally reversible gelling agent or agents to a subsidiary food such as spread, concentrated sauce or the like which has property not capable of solidifying by itself.

When the inventive sheet form food comprising spread, concentrated sauce or the like having thermally gelling agent or agents added thereto is applied to bread or cracker in order to give variation to the taste, color and fragrance of the staple food when eating, the implement such as a knife is not required for manually spreading the subsidiary sheet form food over the staple food. In consequence, it is not required to clean the knife and the like implement each time after the subsidiary food has been applied to the staple food as necessary hitherto in the use of the conventional spreads, concentrated sauces and the like. Furthermore, the amount of the sheet form foods to be applied to the staple food is always substantially constant and does not substantially vary.

In addition, since the inventive subsidiary sheet form food has thermally reversible gelling agent or agents added thereto, the subsidiary food can be eaten by merely being placed on the staple food or being heated to viscous or liquid state thereon.

And since the inventive sheet form food is provided by gelling spread, concentrated sauce or the like with gelling agent or agents, the inherent taste, color and fragrance of the spread, sauce and the like will not be substantially affected.

The inventive sheet form foods can be also eaten by themselves as snacks and garnishings without being placed on bread, crackers or the like.

One method for producing the inventive package containing typical inventive sheet form product therein will be now described.

Spread, concentrated sauce or the like (which is added thereto one or more of the above-mentioned optional materials, seasoning agent and/or flavour agent as the case may be) is added thereto 1–20% by weight of at least one of the above-mentioned thermally reversible gelling agents based on the total weight of the resulting mixture. The obtained mixture is placed in a container formed of thin synthetic resin sheet and the container is then cooled to solidify the content. The obtained package can be then vacuum sealed unlike liquid mixtures. The cooling temperature may be any degree suitable for gelling the mixture, but preferably within the range of -70°C – 0°C . The cooling temperature solidifies the sheet form food to the degree that the obtained solid food can be easily placed in and taken out of the container.

The container formed of synthetic resin sheet preferably has a shallow depth and the food is moulded to the configuration of the interior of the container to obtain the inventive sheet form food.

On the other hand, pieces of one or more members in the above-mentioned optional material group are placed on the bottom of another container and a layer of cheese is placed on the optional material pieces. Thereafter, the sheet form food is taken out of the first-mentioned container in which the food has been moulded to a sheet and placed in the second-mentioned container. The thus obtained package is then vacuum sealed and subjected to heat-sterilization at a temperature within the range of 70 – 90°C , for example, as the case may be.

In this way, a package comprising the inventive sheet form food of spread, concentrated sauce or the like contained in the thin synthetic resin container can be obtained.

The present invention will be described hereinbelow by way of several examples thereof.

Example 1

Material Group A:

	Yolk	1.5 g	
	Vegetable oil	22.5 g	
30	Water	15.0 g	30
	Vinegar	7.5 g	

Material Group B:

	Table salt	2.0 g	
35	Sugar	1.5 g	35
	Mustard	1.0 g	
	Cheese flavor	0.1 g	
40	Aqueous gelatin solution (25% by weight)	29.9 g	40

Optional Material Group:

	Corn	10.0 g	
	Bacon	15.0 g	
	Spanish paprika	2.0 g	
45	Onion	15.0 g	45
	Ham	10.0 g	

The members in Material Group A are admixed and the obtained mixture of 46.5 g is added to 34.5 g of the members in Material Group B at 80°C for 1 minute. The resulting mixture is placed in a container formed of thin synthetic resin sheet (9.5 cm in length, 9.5 cm in width and 10 cm in depth) and the container is cooled at 3°C for 6 hours to solidify the content. The solidified product is sliced into sheet form food pieces each having the length of 9.5 cm, the width of 9.5 cm and the thickness of 5 mm.

Example 2

Material Group A:			
	Pizza sauce	55.0 g	
	Gelatin	7.5 g	
5	Carrageenan	0.2 g	5
	Water	25.5 g	
Material Group B:			
	Sheet form cheese	20.0 g	
10	(L: 9.5 cm; W: 9.5 cm; T: 3 mm)		10
Optional Material Group:			
	Spanish paprika	3.0 g	
15	Salami sausage (four pieces)	12.0 g	15
The members in Material Group A are admixed at 85°C for 1 minute and the obtained mixture of 88.2 g is added to 15 g of Spanish paprika out of the members in Optional Material			
20	Group. The resulting mixture is placed in a container formed of thin synthetic resin sheet (9.5 cm in length, 9.5 cm in width and 10 cm in depth) and the container is cooled at - 20°C for 3 hours to solidify the contents. The obtained solid product is taken out of the container and sliced into sheet form food pieces each having 9.5 cm in length, 9.5 cm in width and 3 mm in thickness.		20
Another container formed of thin synthetic resin sheet (9.5 cm in length, 9.5 cm in width and 6 mm in depth) is provided and four pieces of salami sausage out of the members in Optional			
25	Material Group are placed in the container. 20.0 g of Material Group B is placed on the pieces of salami sausage and the above-mentioned sheet form food pieces are then placed on the sheet form cheese. The package is vacuum sealed and subjected to heat-sterilization at 70°C at the		25
30	central area thereof for 10 minutes to obtain a packaged sheet form food.		30

Example 3

Material Group A:			
35	Mayonnaise	80.0 g	35
	Mustard	10.0 g	
	Gelatin	10.0 g	
	Water	55.0 g	
Optional Material Group:			
40	Tuna	70.0 g	40
	Parsley	3.0 g	
	Bacon	10.0 g	
	Onion	30.0 g	
45			45
The members in Material Group A are admixed at 80°C for 1 minute and the obtained mixture of 155 g is added to the members in Material Group B of 113 g. The resulting mixture is placed in a container formed of thin synthetic resin sheet (9.5 cm in length, 9.5 cm in width and 10 cm in depth) and the container is cooled at - 5°C for 5 hours to solidify the content.			
50	The obtained solid product is taken out of the container and sliced into pieces each having the length of 9.5 cm, the width of 9.5 cm and the thickness of 3 mm. The sliced pieces are placed in another container formed of thin synthetic resin sheet (9.5 cm in length, 9.5 cm in width and 5 mm in thickness). The container is vacuum sealed and subjected to heat-sterilization at 70°C at the central area thereof for 10 minutes to obtain a packaged sheet form food.		50
55			55

Example 4

	Material Group A:			
	Mayonnaise	80.0 g		
	Mustard	10.0 g		
5	Gelatin	10.0 g	5	
	Water	55.0 g		
	Material Group B:			
	Tuna	70.0 g		
10	Parsley	3.0 g	10	
	Bacon	10.0 g		
	Onion	30.0 g		
15	The members in Material Group A are admixed at 80°C for 1 minute and the obtained mixture of 155 g is added to the members in Material Group B of 113 g. The resulting mixture is placed in a box-shaped container formed of thin polypropylene sheet (9.5 cm in length, 9.5 cm in width and 10 cm in depth). The container is cooled at - 5°C for 5 hours to obtain a solid product. The solid product is taken out of the container and sliced into pieces each having the length of 9.5 cm, the width of 9.5 cm and the thickness of 3 mm.			15
20	Another box-shaped container formed of laminated sheet which comprises inner and outer layers of polypropylene and an intermediate layer of ethylenevinyl acetate copolymer (9.5 cm in length, 9.5 cm in width and 3.2 cm in depth) is provided and one of the above-mentioned food pieces is placed in the container. A laminated film similar to that of the container is placed on the food piece within the container. The same procedure is repeated until ten food pieces are laminated one upon another with similar films interposed therebetween within the container. The container is vacuum sealed to provide a package having the food pieces received therein. The package is subjected to heat-sterilization at 70°C at the central area thereof for 10 minutes and then cooled at 5°C.			20
30	When the food pieces are taken out of the container by one at one time, since the interposed films can effectively prevent the successive upper and lower food pieces from adhering to each other, the food pieces can be easily taken out of the container. And since no small holes are formed in the surface of the sheet form food, the food presents an excellent external appearance.			30
35	CLAIMS			35
	1. A composition for forming a sheet-form food which comprises a spread, concentrated sauce or the like and at least one thermally reversible gelling agent.			
	2. A composition as claimed in Claim 1, in which the amount of said thermally reversible gelling agent is 1 to 20% by weight based on the total weight of said composition.			
40	3. A composition as claimed in Claim 1 or 2, in which said spread, concentrated sauce or the like is an aqueous system material, and an oil system food is laminated onto said aqueous system material.			40
	4. A composition as claimed in Claim 3, in which said aqueous system material is pizza sauce and said oil system food is a cheese.			
45	5. A composition for a sheet form food as claimed in Claim 3, in which said oil system food is a member selected from the group consisting of cheese, butter and margarine.			45
	6. A composition as claimed in any preceding claim, in which said spread, concentrated sauce or the like is selected from pizza sauce, ketchup, mustard, mayonnaise, tartar sauce, custard sauce, jam, marmalade, custard cream, white sauce, cream and dressing and yolk, vegetable oil and vinegar.			
50	7. A composition as claimed in Claim 6, wherein said yolk, vegetable oil or vinegar have emulsifying agent or seasoning and flavoring agents added thereto.			50
	8. A composition as claimed in any preceding claim, in which said thermally reversible gelling agent is gelatin, carrageenan, pectin or agaragar.			
55	9. A composition as claimed in any preceding claim, further including at least one optional material.			55
	10. A composition as claimed in Claim 9, in which said optional material is selected from meats, fishes, vegetables, beans, nuts, mushrooms, fruits and eggs.			
60	11. A composition as claimed in Claim 10, in which said meat is ham, sausage, or corned beef, said fish is tuna, said vegetable is onion, Spanish paprika, carrot, potato or sweet corn, said nut is walnut and said mushrooms, fruits and eggs have seasoning and flavoring agents added thereto.			60
65	12. A composition for forming a sheet-form food, substantially as hereinbefore described with reference to any of the food mixtures in the Examples.			
	13. A sheet-form food comprising a spread, concentrated sauce or the like and at least one			65

thermally reversible gelling agent and moulded to a sheet form.

14. A sheet-form food as claimed in Claim 13, which has been formed from a composition as claimed in any preceding claim.

15. A package comprising a container, a sheet-form food received in a plurality of layers one
5 upon another within said container and a film interposed between each two upper and lower 5
adjacent layers of said sheet form food and having the shape and size identical with or similar to
those of each of said sheet form food layers.

16. A package as claimed in Claim 15, in which said sheet form food is as claimed in Claim
14.

10 17. A sheet-form food or package including such a food, substantially as hereinbefore 10
described with reference to any of the Figures of the drawings.

18. A sheet-form food or package including such a food, substantially as hereinbefore
described with reference to any of the foregoing Examples.